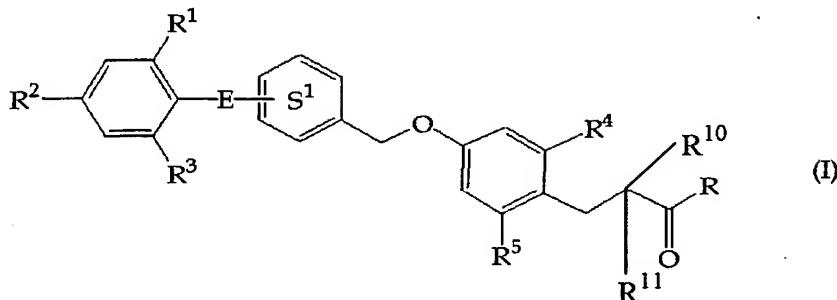


Claims

1. A compound represented by the formula (I):



⁵ wherein

R¹, R³, R⁴ and R⁵

are the same or different and each is a hydrogen atom, a halogen atom, an optionally substituted hydrocarbon group or an optionally substituted hydroxy group;

¹⁰ R² is a halogen atom, a nitro group, an optionally substituted hydrocarbon group, an optionally substituted hydroxy group, an optionally substituted amino group, an optionally substituted mercapto group, an optionally substituted acyl group or an optionally substituted heterocyclic group;

¹⁵ R¹⁰ and R¹¹ are the same or different and each is a hydrogen atom, a halogen atom or a C₁₋₆ alkoxy group;

E is a bond, an optionally substituted C₁₋₄ alkylene group, -W¹-O-W²-, -W¹-S-W²- or -W¹-N(R⁶)-W²- (wherein W¹ and W² are the same or different and each is a bond or an optionally substituted C₁₋₃ alkylene group, and R⁶ is a hydrogen atom, an optionally substituted acyl group or an optionally substituted hydrocarbon group);

ring S¹ is a benzene ring optionally further having substituent(s) selected from a halogen atom, an optionally substituted hydrocarbon group, an optionally substituted hydroxy group and an optionally substituted amino group; and

R is an optionally substituted hydroxy group or an optionally substituted amino group;

provided that R¹ and R³ are not simultaneously a hydrogen atom,

or a salt thereof.

2. The compound of claim 1, wherein R² is a halogen atom, an optionally substituted hydrocarbon group, an optionally substituted hydroxy group, an optionally substituted amino group, an optionally substituted mercapto group or an optionally substituted heterocyclic group, and R¹⁰ and R¹¹ are both hydrogen atoms, or a salt thereof.

¹⁰ 3. A prodrug of a compound of claim 1 or a salt thereof.

4. The compound of claim 1, wherein R⁴ and R⁵ are the same or different and each is a hydrogen atom or a halogen atom, or a salt thereof.

¹⁵

5. The compound of claim 1, wherein E is a bond, or a salt thereof.

²⁰ 6. The compound of claim 1, wherein R is a hydroxy group, or a salt thereof.

7. The compound of claim 1, wherein R¹ and R³ are the same or different and each is a C₁₋₆ alkyl group, or a salt thereof.

²⁵ 8. The compound of claim 1, wherein R² is an optionally substituted hydroxy group, or a salt thereof.

9. The compound of claim 1, wherein R¹⁰ and R¹¹ are both hydrogen atoms, or a salt thereof.

³⁰

10. The compound of claim 1, wherein ring S¹ is a benzene ring optionally further having a C₁₋₆ alkoxy group, or a salt thereof.

11. 3-[4-[[4'-(benzyloxy)-2',6'-dimethylbiphenyl-3-yl]methoxy]phenyl]propanoic acid;
3-(4-{[4'-(2-ethoxyethoxy)-2',6'-dimethylbiphenyl-3-yl]methoxy}phenyl)-2,2-difluoropropanoic acid;

5 3-[4-((4'-[2-(ethylsulfonyl)ethoxy]-2',6'-dimethylbiphenyl-3-yl)methoxy)-2-fluorophenyl]propanoic acid;
3-[4-((2',6'-dimethyl-4'-[3-(2-oxopyrrolidin-1-yl)propoxy]biphenyl-3-yl)methoxy)-2-fluorophenyl]propanoic acid;
3-[4-((2',6'-dimethyl-4'-[(6-methylpyridin-2-
10 yl)methoxy]biphenyl-3-yl)methoxy)-2-fluorophenyl]propanoic acid;
3-[2-fluoro-4-((4'-[(4-hydroxy-1,1-dioxidotetrahydro-2H-thiopyran-4-yl)methoxy]-2',6'-dimethylbiphenyl-3-
yl)methoxy]phenyl]propanoic acid;
3-[4-((2',6'-dimethyl-4'-[(methylsulfonyl)oxy]biphenyl-3-
15 yl)methoxy)-2-fluorophenyl]propanoic acid;
3-[4-((4'-[(1,1-dioxidotetrahydro-2H-thiopyran-4-yl)oxy]-2',6'-
dimethylbiphenyl-3-yl)methoxy)-2-fluorophenyl]propanoic acid;
3-[4-((2',6'-dimethyl-4'-[(3-methyloxetan-3-yl)methoxy]biphenyl-
3-yl)methoxy)-2-fluorophenyl]propanoic acid;

20 3-(4-[[2',6'-dimethyl-4'-(tetrahydro-2H-pyran-4-yloxy)biphenyl-3-yl)methoxy]-2-fluorophenyl)propanoic acid;
3-[4-((4'-[3-(diethoxyphosphoryl)propoxy]-2',6'-
dimethylbiphenyl-3-yl)methoxy)-2-fluorophenyl]propanoic acid;
3-[2-fluoro-4-((6-isopropoxy-2',6'-dimethyl-4'-[(3-methyloxetan-
25 3-yl)methoxy]biphenyl-3-yl)methoxy]phenyl]propanoic acid;
or a salt thereof.

12. A GPR40 receptor function modulator comprising a compound of claim 1 or a salt thereof or a prodrug thereof.

30

13. A pharmaceutical agent comprising a compound of claim 1 or a salt thereof or a prodrug thereof.

14. The pharmaceutical agent of claim 13, which is an agent for the prophylaxis or treatment of diabetes.

15. Use of a compound of claim 1 or a salt thereof or a prodrug thereof for the production of a GPR40 receptor function modulator.

16. Use of a compound of claim 1 or a salt thereof or a prodrug thereof for the production of an agent for the prophylaxis or treatment of diabetes.

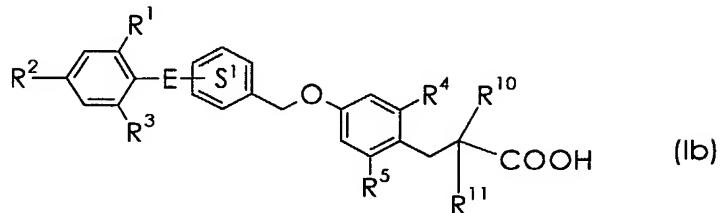
17. A method of modifying a GPR40 receptor function in a mammal, which comprises administering an effective amount of a compound of claim 1 or a salt thereof or a prodrug thereof to the mammal.

15

18. A method for the prophylaxis or treatment of diabetes in a mammal, which comprises administering an effective amount of a compound of claim 1 or a salt thereof or a prodrug thereof to the mammal.

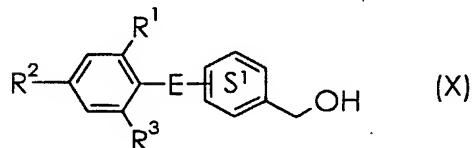
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19. A production method of a compound represented by the formula (Ib) :

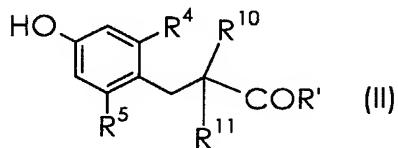


wherein R¹, R², R³, R⁴, R⁵, R¹⁰, R¹¹, E and ring S¹ are as defined in claim 1,

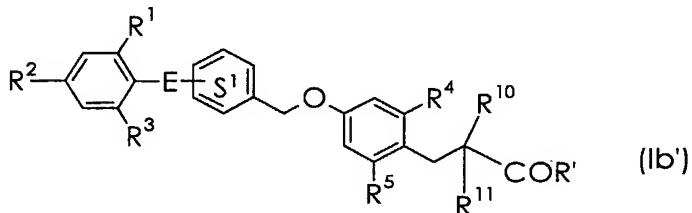
or a salt thereof, which comprises reacting a compound represented by the formula (X) :



wherein each symbol is as defined above,
or a salt thereof, and a compound represented by the formula
(II) :

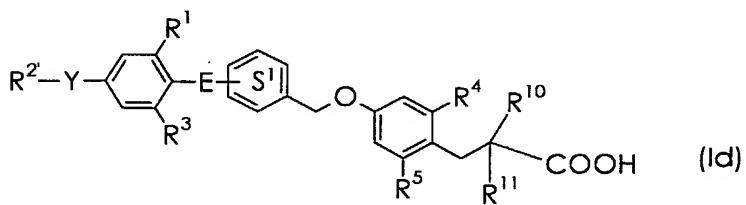


5 wherein R⁴, R⁵, R¹⁰ and R¹¹ are as defined above, and R' is an
optionally substituted C₁₋₆ alkoxy group,
or a salt thereof, to give a compound represented by the formula
(Ib') :

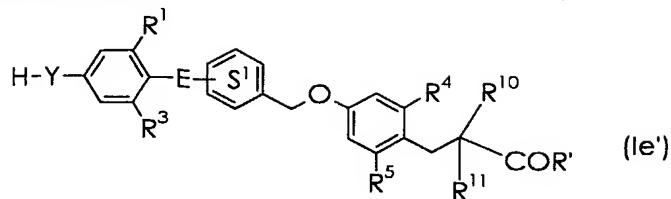


10 wherein each symbol is as defined above,
or a salt thereof, and subjecting the compound or a salt thereof
to a hydrolysis reaction.

20. A production method of a compound represented by the formula
15 (Id) :



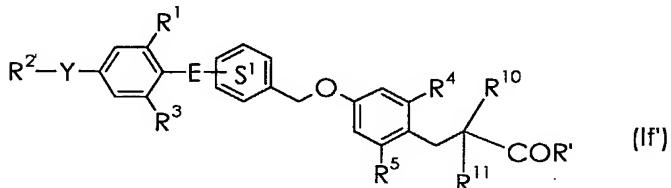
wherein R¹, R³, R⁴, R⁵, R¹⁰, R¹¹, E and ring S¹ are as defined in
claim 1, Y is -O- or -S-, and R² is a substituent,
or a salt thereof, which comprises reacting a compound
20 represented by the formula (Ie') :



wherein R^1 , R^3 , R^4 , R^5 , R^{10} , R^{11} , E and ring S^1 are as defined above, R' is as defined in claim 19, or a salt thereof, and a compound represented by the formula:

5 $R^{2'}-\text{OH}$

wherein $R^{2'}$ is as defined above, or a salt thereof, to give a compound represented by the formula (If'):



10 wherein each symbol is as defined above, or a salt thereof, and subjecting the compound or a salt thereof to a hydrolysis reaction.